Photocatalytic Water Purification with ZnO Thin Films in Demineralized as Well as Natural Waters - DTU Orbit (28/10/2019)

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ZnO films prepared on glass plates using a water based coating solution are characterized and tested for methylene blue dye photocatalytic decolourization in various types of waters (demineralized water, sea-, and lake-water). The influence of various parameters such as wavelength and attenuation of incident radiation by dye and/or organic matter is studied. In demineralized water, up to 90% decoloration is achieved within 1 h with 365 nm irradiation on a 10 ml solution. Although the ZnO films still show some activity when illuminated by standard visible light lamps, the efficiency of the photocatalytic process is greatly reduced. Natural waters result in a significant decrease of the photocatalytic activity, under both UV and visible light irradiation. The main factor is believed to be enhanced UV light absorption within the liquid. The influence of organic and mineral matter in natural waters is briefly discussed.

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